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## **Explanation of Significant Differences**

**Eagle Zinc Site  
EPA ID: ILD980606941  
Hillsboro, Illinois**

**U.S. Environmental Protection Agency  
Region 5**

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## **Executive Summary**

The U.S. Environmental Protection Agency (EPA) is issuing an Explanation of Significant Differences (ESD) to document the remedial action cost estimate increase for the Operable Unit 1 (OU 1) remedial action selected in the interim record of decision (ROD). The cost estimate presented in a ROD is expected to be accurate to +50%, -30%. The cost estimate increased 66% above the cost estimate in the ROD, a significant difference. This ESD serves to document the changes to the remedial action cost estimate and provide an explanation for the significant difference.

The Eagle Zinc Site encompasses about 132 acres, 30 acres of which consists of buildings and structures. The Site is divided into two operable units (OUs). OU 1 is an interim action that addresses the contamination associated with the buildings and structures on the Site. OU 2 addresses the soil, ground water, surface water, and residue on the Site. The focus of this ESD is OU 1, the interim remedial action. This is the first ESD for the Site.

## **Explanation of Significant Differences Eagle Zinc Superfund Site**

### **I. Introduction**

#### **A. Site Name and Location**

The Eagle Zinc Site (the Site) is located on the northeastern side of Hillsboro, Illinois, approximately 50 miles northeast of St Louis, Missouri. According to the 2010 census, Hillsboro is home to a little over 6,200 citizens. The Site is located in a mixed commercial/industrial/residential area and the nearest residential area is approximately 100 feet southwest of the Site. The Site was historically used for zinc oxide production, zinc smelting and related operations for about 90 years, until 2003. The property encompasses approximately 132 acres, on which there are about 30 acres of buildings. The Site has been divided into two operable units (OUs): OU 1 addresses the interim remedial action regarding the contaminated buildings, while OU 2 addresses the soil, residue, sediment, surface water and ground water at the Site. No remedial action has been selected for OU 2; it is currently in the investigative stage. The buildings (OU 1) are the focus of this Explanation of Significant Differences (ESD).

#### **B. Lead and Support Agencies**

The U.S. Environmental Protection Agency is the lead agency for the implementation of the fund-lead remedial action. Illinois EPA (IEPA) is the support agency.

#### **C. Statement of Purpose and Statutory Basis**

This decision document sets forth the basis for issuing an ESD to the September 16, 2009 OU 1 Interim Record of Decision (ROD) for the Eagle Zinc Site in Hillsboro, IL. Section 117(c) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Section 300.435(c)(2)(i) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establish procedures for explaining, documenting, and informing the public of significant changes to the remedy that occur after the ROD. An ESD is required when the remedial action to be taken differs significantly from the remedy selected in the ROD but does not fundamentally alter the remedy with respect to scope, performance or cost.

In this case, the ESD documents and explains the significant increase in the cost estimate (CE) provided in the final design and the CE provided in the OU 1 Interim ROD. The selected remedy for OU 1 consists of the demolition of all buildings and structures, the storage of demolition debris and non-hazardous materials in an onsite management cell, the proper storage of hazardous materials onsite until final remedial action, and the disposal of

putrescible and asbestos containing materials off-site. Nothing about the OU1 remedy has changed except for the increase in estimated costs.

#### **D. Summary of Circumstances Necessitating this ESD**

The circumstance necessitating this ESD is the 66% increase in estimated remedial action costs from the ROD CE to the current CE (which was generated as part of the remedial design). The CE in the final design, however, is generally a more accurate cost estimate. The final design CE for the interim Remedial action is \$6,202,205. This presents a \$2,473,363 increase (66%) from the ROD cost estimate of \$3,728,842. The CE provided in the ROD anticipated the remedial action to cost \$3,869,733. However, recalculation of the line items presented in the ROD CE indicated that the correct total capital cost was \$3,728,842 (See Table 2).

There are three main reasons for the difference between the two CEs. First, a steel salvage credit was added to the ROD CE, but EPA determined the credit was too uncertain and should not be included in the CE for the design – this change accounts for a \$726,040 increase in the RA costs. Secondly, pre-design field work provided new information about the buildings and materials that altered the amount and type of treatment and disposal – producing a cost increase of \$726,947. Lastly, the ROD CE did not include the cost of remedial action oversight by a primary contractor – accounting for an increase of \$1,020,376. A more detailed explanation of these modifications to the CE is provided in section IV.

#### **E. Agency Determination**

EPA, in consultation with IEPA, has reviewed the changes to the Eagle Zinc Site interim remedial action in accordance with CERCLA and EPA policy and guidance. EPA has determined that the changes to the OU 1 Interim ROD remedial action are significant, but do not fundamentally alter the overall interim action for the Site with respect to scope, performance, or cost. The modified remedy complies with the NCP and the statutory requirements of CERCLA and remains protective of human health and the environment. Thus, it is appropriate to issue an ESD to document the changes resulting in that modification.

#### **F. Administrative Record**

In accordance with Sections 300.435(c) and 300.825(a)(2) of the NCP, this ESD and supporting documentation will become part of the administrative record for the Site.

The administrative record is available for public review at the following location:

EPA Region 5 Records Center  
77 West Jackson Boulevard – 7<sup>th</sup> Floor  
Chicago, IL 60604

8:00 a.m. – 4:00 p.m. M-F

An information repository is also located at:

Hillsboro Public Library  
214 School Street  
Hillsboro, IL 62049

Hours: Monday and Friday - 9:30 a.m. - 5 p.m.  
Tuesday, Wednesday, and Thursday - 9:30  
a.m.-7:30 p.m.  
Saturday - 9:30 a.m. - 1:00 p.m.

## **II. Site History, Contamination, and Selected Remedy**

### **A. Site History**

Zinc processing operations began at the Site in 1912, at which time the facility operated as a zinc smelter under the name Lanyon Zinc Company. The smelting products included zinc and sulfuric acid. The Site was purchased by Eagle-Picher Industries (Eagle-Picher) in 1919. Eagle-Picher conducted zinc smelting and manufacture of sulfuric acid until approximately 1935. During the early 1920s, the manufacture of zinc oxide and leaded zinc oxide commenced at the Site. The leaded zinc oxide was manufactured by combining basic lead sulfate with zinc oxide. These activities ceased around 1958. Eagle-Picher continued to manufacture zinc oxide at the Site until November 1980, at which time the Site was purchased by The Sherwin-Williams Company (Sherwin-Williams). Sherwin-Williams continued zinc oxide manufacturing operations at the Site until the company sold the plant in 1984 to Eagle Zinc Company, a division of T.L. Diamond & Company (Eagle Zinc). Eagle Zinc continued manufacturing zinc oxide using the process employed by Sherwin-Williams and Eagle-Picher.

Zinc oxide was manufactured at the Site using both direct and indirect processes. The indirect process involved the processing of zinc metal in a muffle furnace. The direct process, which was used until the plant closed in early 2003, involved the processing of zinc ores and the stockpiling of furnace residues in a rotary kiln furnace. Residual materials historically generated by the manufacturing operations included, among other things, rotary kiln residue, muffle dross, metallic zinc particles, and refractory bricks from the facility's furnaces. In addition, Eagle Zinc produced a fine-grained product that is rich in carbon by screening stockpiled rotary residues using a rotary screen and other processes.

### **B. Contamination**

Several environmental investigations were conducted on the property and in adjacent land areas since the early 1980s, and before the initiation of the remedial investigation (RI) in 2001. At the time the RI began, the plant was still operating and the remedial

investigation/feasibility study (RI/FS) was focused on the non-operating areas of the Site. Eagle-Picher, Sherwin-Williams, and Eagle Zinc completed a draft RI in 2005.

In reviewing the draft RI and FS, EPA and IEPA recognized that additional investigation was needed in and around the plant buildings since the plant was no longer operating. EPA, in consultation with IEPA, decided to establish a new operable unit to address the plant building area (OU 1) and to consider the area within the original scope of the draft RI/FS as OU 2. A supplemental remedial investigation and feasibility study for OU 2 is currently underway. Since the focus of this ESD is the OU1 interim ROD, the discussion of contamination will be limited to OU 1.

IEPA completed x-ray fluorescence (XRF) sampling in the spring of 2008 to investigate the buildings. Approximately one half of the samples were collected inside of the buildings and the remaining samples were collected outside of the building structures. Ten samples were also collected and submitted for confirmatory laboratory analysis of total metals and toxicity characteristic leaching procedure (TCLP) metal analysis. Most of the confirmatory samples taken were determined to be characteristically hazardous for lead. The highest concentration for lead detected was 56,576 ppm. The location of this sample is in the central area between the building structures. Other metals reported include arsenic, zinc, copper, nickel, chromium, barium and cadmium.

About 70% of the samples collected within the building structures exceeded EPA's target screening level of 800 ppm, while 100% of the samples collected outside of the building structures exceeded the 800 ppm screening level. Results of the confirmatory sampling results were two to five times greater than the field XRF results. Ninety percent of the TCLP samples exceeded the TCLP limit for lead. The contaminated materials that are characteristic RCRA hazardous wastes will be handled separately from the non-hazardous waste in the interim response. The majority of the samples taken inside the building were taken from the floors or higher flat surfaces. The actual building debris, although contaminated, is not likely to be classified as RCRA hazardous waste. Potential risks exist for people coming into contact with the residue piles and contaminated building materials. Also, these buildings present a physical hazard due to their poor structural integrity.

As part of the effort to quickly mitigate risk associated with the highly contaminated buildings and Site soils, EPA conducted a removal action between December 2008 and January 2009. The removal action consisted of fence installation around the most accessible areas of the Site. About 2,150 feet of fencing and signage were installed between December 15, 2008 and January 9, 2009. According to community members, this remedial measure has decreased the amount of trespassers, but some people continue to trespass.

### C. Selected Remedy

The selected remedy is considered an interim remedial action for the Site. This limited-scope action is intended only to address the contamination associated with the buildings, structures onsite and associated materials. A final response action to fully address the threats posed by the Site will be taken in OU2 upon completion of the Supplemental RI/FS.

The selected remedy components include:

- Building Demolition – All buildings and associated structures on the Site will undergo controlled demolition.
- Asbestos Contaminated Material (ACM) and putrescible wastes – An asbestos survey will be conducted for all onsite buildings and any ACM and putrescible waste will be appropriately disposed of offsite.
- Recycling – Any salvageable material will be recycled or reused. Any material eligible for recycling (e.g., steel, metal and bricks) will be decontaminated or treated as necessary to the levels acceptable to the recycling facility.
- Onsite Consolidation – All remaining demolition debris will be consolidated and placed in the southwest corner of the Site in a temporary onsite management cell.
- Hazardous Materials – Any RCRA hazardous wastes will be identified, separated from non-hazardous waste and placed in segregated areas so they can be managed more efficiently in the final remedy.
- Soil Cover – A one-foot soil cover will act as a physical barrier to the contaminated building debris consolidated at the Site.

### III. Basis for the ESD

Table 1 summarizes the changes to the remedy documented in this ESD. Further descriptions of the changes are provided in the subsequent section. With these changes, the remedy will continue to be protective and meet applicable or relevant and appropriate requirements (ARARs). In addition, all remedial action objectives will continue to be met. Because hazardous waste will remain onsite at levels that do not allow for unrestricted use and unlimited exposure, five-year reviews of the Site remedy will be required.

**Table 1: Changes to Remedy Being Documented in ESD**

<b>Remedy Component in 2009 OU 1 Interim ROD</b>	<b>Change in Remedy Documented in ESD</b>
Building and Structure Demolition	No Change
Off-Site Disposal of Asbestos Contaminated Materials (ACM) and Putrescible Waste	No Change
Recycle Salvageable Material	No Change
Onsite Management Cell with Vegetative Soil Cover	No Change

Hazardous Waste Stored Onsite Until Final Remedy	No Change
Cost is \$3,728,842	Cost is \$6,202,205 (66% difference)

#### **IV. Significant Differences to the OU 1 Interim ROD Remedial Action**

##### **A. Modification of the Remedial Action Cost Estimate**

The ROD CE projected that the selected remedy, building demolition and onsite management of debris would cost \$3,728,842. The most recent cost estimate, the remedial design CE, expects the actual remedial action costs to be 66% more than originally anticipated; the RA will cost \$6,202,205 to implement. There are three reasons for the significant increase in the remedial action cost estimate: steel recycling credit, new information, and RA oversight costs. For a more detailed breakdown of cost changes refer to Table 2. Nothing about the OU1 remedy has changed except for the increase in estimated costs.

The CE provided in the ROD included the anticipated amount of credit the Agency would receive by recycling the steel from the buildings and structures onsite. The credit was estimated to be about \$726,040. This estimate was derived from two assumptions: 1) 2,593 tons of steel could be recycled for profit, and 2) the price of steel per ton would be \$280. EPA decided not to include the estimated steel credit in the remedial design cost estimate because the assumptions regarding the amount of money recycling the steel would produce are highly variable. The estimated price of steel used for the ROD CE is out dated for the current economic climate. It is very difficult to predict how much funding credit EPA may yield from the planned recycling. In addition, the funding that will be needed to implement the RA will be needed before any recycling credit is realized. The remedial action needs to be fully funded no matter how much, if any, proceeds are received to offset those costs. The removal of the steel credit from the RA cost estimate provides a more accurate cost estimate and ensures that the remedy can be fully implemented when funding becomes available. This change increased the overall remedial implementation costs by \$726,040.

Another reason why the CE in the final design is higher than the ROD CE is because the design process revealed new information, which was then incorporated in the current CE. Pre-design activities were conducted at the Site to further characterize the buildings and structures to be demolished. The results indicated that significant decontamination and waste management activities were required for the safe decommissioning and demolition of the buildings. These activities were underestimated or not included in the ROD CE due to lack of building-specific information. The pre-design sampling work found more asbestos, universal waste, and hazardous waste inside the buildings than expected. Other costs not included in the original CE estimate but incorporated into the most recent CE include:

building decontamination, erosion control, and air monitoring. In addition, the cost estimating standards used in the ROD estimate were from 2003; the RA cost estimate provided in the design uses cost estimating standards from 2010. The new information incorporated into the remedial cost estimate increased the overall cost of the remedial action by \$726,947.

The third reason why the estimated remedial action cost increased by 66% is because the ROD CE did not include the line items associated with the cost of a prime contractor to oversee the implementation of the remedial action. These line items include contractor general and administrative costs, the contractor fee, program support and professional liability insurance. The oversight cost is generally estimated to be about 20 percent of the construction costs for a remedial action. In the case of the OU 1 RA, the oversight expense is \$1,020,876, or 20 percent of \$5,181,829. Therefore, the addition of the oversight costs to the CE increased the projected RA costs by \$1,020,876.

**Table 2: Cost Estimate Comparison**

<b>Task</b>	<b>ROD CE (\$)</b>	<b>Design CE (\$)</b>	<b>Difference (\$)</b>	<b>% Change</b>
Building Demolition	2,279,091	3,083,314	+ 804,223	+ 35%
Waste Disposal	67,195	81,555	+14,360	+21%
Steel Salvage Credit	726,040	0	+726,040	+100%
Cover Construction	125,144	156,522	+31,378	+25%
Demo Debris Loading and Placement	140,891	168,827	+27,936	+20%
ACM, Universal Waste, Hazardous Waste & Liquid Waste T&D	0	186,598	+186,598	+100%
Subcontractor General Conditions	391,848	275,761	-116,087	-30%
Contingency	491,351	592,887	+101,536	+21%
Management/Procurement	226,022	272,728	+46,706	+21%
Design <sup>1</sup>	301,362	0	-301,362	-100%
Mobilization/Demobilization <sup>2</sup>	130,616	0	-130,616	-100%
Construction Management	301,362	363,637	+62,275	+21%
Prime Contractor Oversight	0	1,020,376	+1,020,376	+100%
<b>Total</b>	<b>3,728,842<sup>3</sup></b>	<b>6,202,205</b>	<b>+2,473,363</b>	<b>+66%</b>

1 – Not generally included in design CE; 2 – cost is included as part of task 1 of design CE; 3 – This cost is lower than the cost presented in the ROD because the ROD CE contains a calculation error.

## **V. State Comments**

The IEPA has reviewed this ESD and concurs with the significant change in remedy. The IEPA concurrence letter will be added to the administrative record upon receipt.

## **VI. Statutory Determinations**

EPA has determined that the increase in cost of the remedial action is necessary for the adequate implementation of the selected remedial action. EPA has determined that this

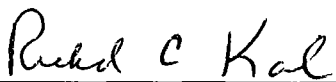
change, as documented in the ESD, is in accordance with CERCLA Section 121 and is protective of human health and the environment. The change complies with federal and state requirements that are applicable and or relevant and appropriate, use permanent solutions to the maximum extent practicable, and is cost-effective. Since hazardous waste will remain onsite at levels that do not allow for unrestricted use and unlimited exposure, five-year reviews of the remedy will be required.

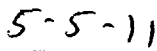
## **VII. Public Participation Compliance**

EPA shall publish a brief description of the ESD in the local newspaper as required by the NCP at 40 C.F.R. Section 300.435 (c)(2)(i)(B). This ESD will also be placed in the administrative record files and information repository which are located at the Hillsboro Public Library and in the EPA Region 5 office as required by the NCP Section 300.435(c)(2)(i)(A). See Section I, paragraph F, of this ESD for further details about the information repositories. An electronic copy of this ESD will be available online at <http://www.epa.gov/region5/sites/eaglezinc/>.

## **VIII. Declaration by EPA**

EPA has determined that the modifications to the OU 1 Interim ROD for the Eagle Zinc Site documented in this ESD are significant, but do not fundamentally alter the overall Site remedial action with respect to scope, performance, or cost. I therefore approve the issuance of this ESD for the Eagle Zinc Site and the changes to the remedial action stated herein.

  
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Richard C. Karl, Director  
Superfund Division  
U.S. EPA Region 5

  
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Date